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Life cycle assessment for three ventilation methods

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Abstract

A sustainable ventilation method is one of the possible solutions to mitigate climate change and carbon emission. This method shall involve an analysis of the environmental impact, energy performance, and economical cost-effectiveness. There are still few studies concerning the life cycle assessment (LCA) of various alternative ventilation systems incorporating the combined effect of life cycle cost (LCC) and carbon emission in the supply-and-installation phase, as well as energy performances in the operation phase. The supply-and-installation phase of the system materials and components has a significant contribution to the total energy consumption and environmental loads of buildings. This paper covers a systematic approach to estimate their environmental impact, which was counted in terms of energy demand and CO₂ emission in the two phases. This approach has been applied to an actual typical classroom served by mixing ventilation (MV), displacement ventilation (DV) and stratum ventilation (SV). The results show that SV has the least environmental impact and life cycle cost (LCC). Results of this analysis demonstrated that by adopting DV

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